

THE GENUS *TIBOUCHINA* IN SOUTHERN VENEZUELA.

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At the present time ten species of the large genus *Tibouchina* are known to occur in the mountains and savannas of southern Venezuela. Six of these are endemic to the region. Since considerable attention is now directed to the flora of this area, a brief conspectus of these species may be useful to students.

In every species of *Tibouchina* the upper surface of the leaf bears some kind of trichomes which are always adnate at base to the epidermis. The adnate portion may be very short in proportion to the free tip, or the tip itself may be very short, or scarcely developed, or occasionally lacking. The tip may vary from capillary to subulate, or it may be flattened and vary from lanceolate to ovate. When flattened, the hair-tips are naturally known as scales, and the indument is described as lepidote. Hairs of the same type occur also in a few other genera related to *Tibouchina*, and in one of them (*Chaetolepis*) several species show an analogous reduction to scales. In *Purpurella grossa*, often referred to *Tibouchina*, the hairs are not adnate at the base. This feature, together with the short blunt anthers, is evidence that the genus may well be segregated. In *Tibouchina mollis* also the hairs are barely adnate, and many may be observed which are completely free. Here the stamens are short and blunt and the connective not prolonged and very obscurely lobed, again suggesting a possible segregation of this species into another genus.

The hair-bases appear as fine striae on the surface. They are always more or less parallel, but are arranged in several series, in each of which they lie at a fairly constant angle from the nearest primary vein. They are often obscured or hidden if the free tips are slender and elongate.

In lepidote species the bases may be short or long. If they are much shorter than the distance between the primary veins, the surface will then be occupied at fairly regular intervals by the minute flattened tips, all pointing in the same direction; such a leaf may be retrorsely scabrous to the touch. If the hair-bases are elongate, those directed from the midvein toward the margin and those extending from the lateral veins toward the midvein meet in a longitudinal strip which always lies closer to the lateral vein than to the midvein. The projecting tips are now restricted to this zone and produce a distinctly visible scabrous strip on an otherwise glabrous surface, referred to by Pittier as a false vein. This strip may be several scales wide, as in *T. fraterna*, or very narrow, as in *T. Spruceana*. Hairs extend-

ing from the outer primary veins to the margins end in marginal scales which are usually directed toward the apex of the leaf and are more or less imbricate.

Scales also appear on the hypanthium of five of the ten species. In *T. aspera* and *T. Spruceana* they are lanceolate and elongate, often somewhat lacerate; they project much beyond the body of the hypanthium and nearly conceal the sepals. In the other three species the scales are much shorter, closely appressed, and symmetrically imbricate in intersecting oblique rows, simulating the spirals of the Fibonacci series as shown in the pine cone. These three species resemble each other in many floral features and form a distinct species-group, related to and possibly including the Andean *T. lepidota*.

The ten species of the region may be identified by the following key:

Upper leaf-surface lepidote, the subulate or flattened free tips much shorter than the adnate, parallel, closely approximate bases.

Hypanthium covered with flat scales; each flower subtended by a pair of bracts.

Bracts connate by their margins into a 2-lobed cup partly enclosing the hypanthium; scales of the hypanthium lanceolate, elongate, projecting.

Leaves 5-nerved; hairs of the upper surface ending irregularly, forming four rather indefinite strips of free subulate tips; younger stems covered with loosely appressed or strongly ascending, narrowly triangular scales. *T. aspera.*

Leaves 3-nerved; hairs of the upper surface ending regularly, forming two very narrow strips or lines of free subulate tips; younger stems well covered with ovate, completely appressed scales. *T. Spruceana.*

Bracts free; hypanthial scales short, appressed in regular series, not projecting.

Leaves 3-nerved, the free, appressed, flattened hair-tips forming two broad strips. *T. fraterna.*

Leaves 1-nerved, the hairs ending at the margin, or very short.

Upper leaf-surface covered with completely adnate hairs, or with a few free tips at the margin

T. sipapoana.

Upper leaf-surface covered with ovate appressed scales symmetrically disposed in rows.

T. duidae.

Hypanthium pilose, not lepidote; bracts present or lacking.

Bracts present and conspicuous; hypanthium beset, especially distally, with fleshy finger-like projections densely covered with long white hairs.

T. striphnocalyx.

Bracts none or early deciduous; hypanthium glandular-pubescent with ascending hairs 1--1.5 mm. long.

T. Kunhardtii.

Upper leaf-surface pilose with slender elongate hairs.

Leaves subsessile; stems simple, the upper leaves greatly reduced and bearing short-peduncled clusters of flowers, forming an elongate virgate inflorescence; petals 1.5--2 cm. long.

T. gracilis.

Leaves distinctly petioled; stems freely branched; petals 4--8 mm. long.

Leaves lanceolate, long-acuminate; stamens isomorphic but differing somewhat in size; connective not or scarcely prolonged below the filament.

T. longifolia.

Leaves ovate-lanceolate, about half as wide as long; stamens distinctly dimorphic; connective prolonged past the apex of the filament.

T. pseudomollis.

Tibouchina aspera Aubl. Common and widely distributed on savannas; variable in stature and especially variable in the length of the free hair-tips.

Tibouchina Spruceana Cogn. Restricted, as far as known, to sandstone savannas in British Guiana and southern Venezuela at moderate elevations.

Tibouchina fraterna N. E. Br. Abundant throughout the mountains from Roraima to Duida but not descending to the savannas at low altitude.

Tibouchina sipapoana Gl. sp. nov. Caules petioli folia subtus et hypanthia lepidoti; folia parva subsessilia coriacea elliptica uninervia, supra glabra, pilis toto adnatis, ad margines uniseriatim lepidota; flores sessiles terminales solitarii, bracteis 2 liberis sustentis; sepala erecta triangularia hypanthio longiora.

Stem 4-angled or 2-sulcate, the internodes up to 3 cm. but often only 2--3 mm. long. Petioles 2--3 mm. long. Leaf-blades coriaceous, somewhat conduplicate, elliptic or somewhat obovate, 8--15 mm. long, about half as wide, rounded or obtuse at both ends, 1-nerved, entire, but apparently minutely serrulate from a marginal row of scales; upper side glabrous, the totally adnate hairs extending from midvein to margin; lower surface lepidote. Flowers solitary, terminal, subsessile; bracts separate, opposite, coriaceous, oblong,

8.5 mm. long, 3 mm. wide, lepidote. Hypanthium 5.5 mm. long, cup-shaped or somewhat campanulate, closely lepidote with beautifully imbricate, broadly ovate, closely appressed scales about 1.5 mm. long, with a larger scale at each sinus. Sepals erect, triangular, 7 mm. long, 3.3 mm. wide at base, acute, but the sides involute above and therefore appearing acuminate, glabrous within, lepidote on the back like the hypanthium. Petals broadly triangular-obovate, 17 mm. long, 13 mm. wide, narrowed to the base, minutely erose-ciliate across the broadly rounded summit. Stamens isomorphic but somewhat different in size; filaments slender, glabrous, 8.3 or 7.7 mm. long; anthers erect, linear, 6.2 or 5.2 mm. long, opening by a ventro-terminal pore; connective terete, horizontal, 2 or 1.5 mm. long, minutely bilobed below the filament. Ovary setose at the summit; style about 13 mm. long, gradually tapering to a punctiform stigma.

Type, Maguire 27658, from the summit of Mount Sipapo. It closely resembles *T. duidae* in habit and floral characters, but differs completely in the indument of the upper leaf-surface.

Tibouchina duidae ined. First known from a collection by Steyermark on the summit of Duida, which will be the type when the species is formally published, and now known also from a collection by Mrs. Phelps on the summit of Parú. The present use of the name without a Latin diagnosis does not constitute publication. That will be effected in a forthcoming report on the collections of Steyermark from this region.

Tibouchina striphnocalyx (DC.) Gl. comb. nov. Osebeckia striphnocalyx DC., Prodr. 3: 140. 1828; Chaetogastra striphnocalyx Mart.; Pleroma striphnocalyx Tr.; Pterolepis striphnocalyx Cogn.; Tibouchina yavitensis Pitt. Hypanthium, sepals and bracts densely villous with copious white hairs up to 6 mm. long, but since some of these are inserted on processes up to 5 mm. long, their apparent length is as much as 11 mm.

This strange-looking plant was first collected by Martius somewhere along the upper Orinoco. A second collection by Spruce is said to come from San Carlos on the Río Negro; it became the type of var. grandifolia Cogn. As late as 1930 these two collections were the only ones available, but in the last few years ample material has come to hand.

Pittier is the first modern botanist who has considered the species, basing his study on Williams 13891, from Yavita on the upper Orinoco. He agreed with Triana, as I do also, that the plant belongs to the genus *Tibouchina* (or *Pleroma* of Triana). In fact, there is little reason except histori-

cal usage. Pittier compared his plant with the var. *grandiflora* and decided that it represented another species, which he named *T. yavitensis*. Williams' plant was collected at an altitude of only 128 meters and, so far as known, neither Spruce nor Martius climbed much above the lowland forests. It was not noted by Tate on Duida or Auyan-tepui; Steyermark did not find it on the various mountains which he visited. When Maguire reported it as a common shrub, repeatedly observed on the summit of Sipapo at altitudes above 1350 m., the question of a possible second species arose.

I have carefully compared Maguire's several collections with the Williams and Spruce plants. Aside from minor differences in dimensions they are alike in leaves, pubescence, and calyx; our specimens of Williams and Spruce do not show petals or stamens. All three agree also in a feature which has not been made clear in printed descriptions. The hypanthium is very densely villous and the surface is mostly concealed. After boiling and dissecting, it is seen that these hairs are grouped in fascicles, as is the case in the genus *Pterolepis*. The bases to which the hairs are attached vary in size. The lowest ones are mere raised swellings with an apical tuft of hairs only. The upper bases are progressively elongated, until those near the summit of the hypanthium are 5 mm. long and bear hairs along their sides as well as at the summit. These are the "appendages alternating with the calyx-lobes," as mentioned by Pittier and Martius and also crudely illustrated by the latter. His statement that they exist on the typical variety removes the last excuse for dividing the species.

Tibouchina Kunhardtii Gl. sp. nov. Sect. *Diotanthera*. Caulis parce ramosi, squamis adpressis non imbricatis tecti; folia subsessilia, oblanceolata, 5-nervia vel fere 5-plinervia, utrinque pilis fere toto adnatis dense tecta. Hypanthium et sepala triangularia breviter glanduloso-hirsuta. Stamina fere isomorpha; connectivum infra thecas breviter productum valde incurvum, infra apicem filamenti breviter bilobum.

Sparingly branched shrub 1--2 m. tall. Scales of the subterete stem 0.5--1.2 mm. long, those of the pedicels more spreading. Leaves firm, oblong or oftener oblanceolate, up to 10 cm. long and a third as wide, often smaller and only a fourth as wide, acute or subacuminate, entire, acute at base or somewhat cuneate, 5-nerved or barely 5-pli-nerved, the outer pair of nerves submarginal; hairs on both surfaces alike, the free tips narrowly subulate, 0.1--0.5 mm. long. Flowers 5-merous, in loose, open, trichotomous panicles, on pedicels up to 1 cm. long. Sepals triangular, 4 mm. long. Petals broadly ovate, 9 mm. long. Filaments 3.5--4 mm.

mm. long; anthers 3.5—4 mm. long; connective prolonged 0.6 or 0.8 mm. to the summit of the filament and below the filament into two slightly divergent, conic, obtuse lobes.

Collected seven times by Maguire on the summit of Cerro Sipapo, always in the wet soil of bogs and stream-banks; his number 27713 has been selected as the type. It is the only species of the section, so far as known to me, with hairs of the type described on the leaf.

Tibouchina gracilis (Bonpl.) Cogn. Widely distributed in tropical America, especially on savannas.

Tibouchina longifolia (Vahl) Baill. The most generally distributed species of the genus, extending from Mexico and Cuba to Paraguay and from sea-level to high altitudes.

Tibouchina pseudomollis Gl. Still known only from the type, collected by Tate just south of Roraima.

Tibouchina Catherinae Pitt., the type of which I have not yet seen, appears from the description to be a synonym of *T. fraterna*.

Acisanthera lasiophylla (Benth.) Gl. comb. nov. *Chaetogastra lasiophylla* Benth. Hook. Jour. Bot. 2: 291. 1840; *Tibouchina lasiophylla* Cogn.; *Pterolepis lasiophylla* Triana; *Acisanthera erecta* Gl. Careful comparison of the types of Bentham's *C. lasiophylla* and my *A. erecta* shows clearly that they are conspecific and leaves no room for doubt that the species belongs in *Acisanthera*, to which genus the valid specific name is hereby transferred. Sandstone savannas at moderate elevations; collected only a few times.